GEOGRAPHIC

SCHOOL BULLETINS

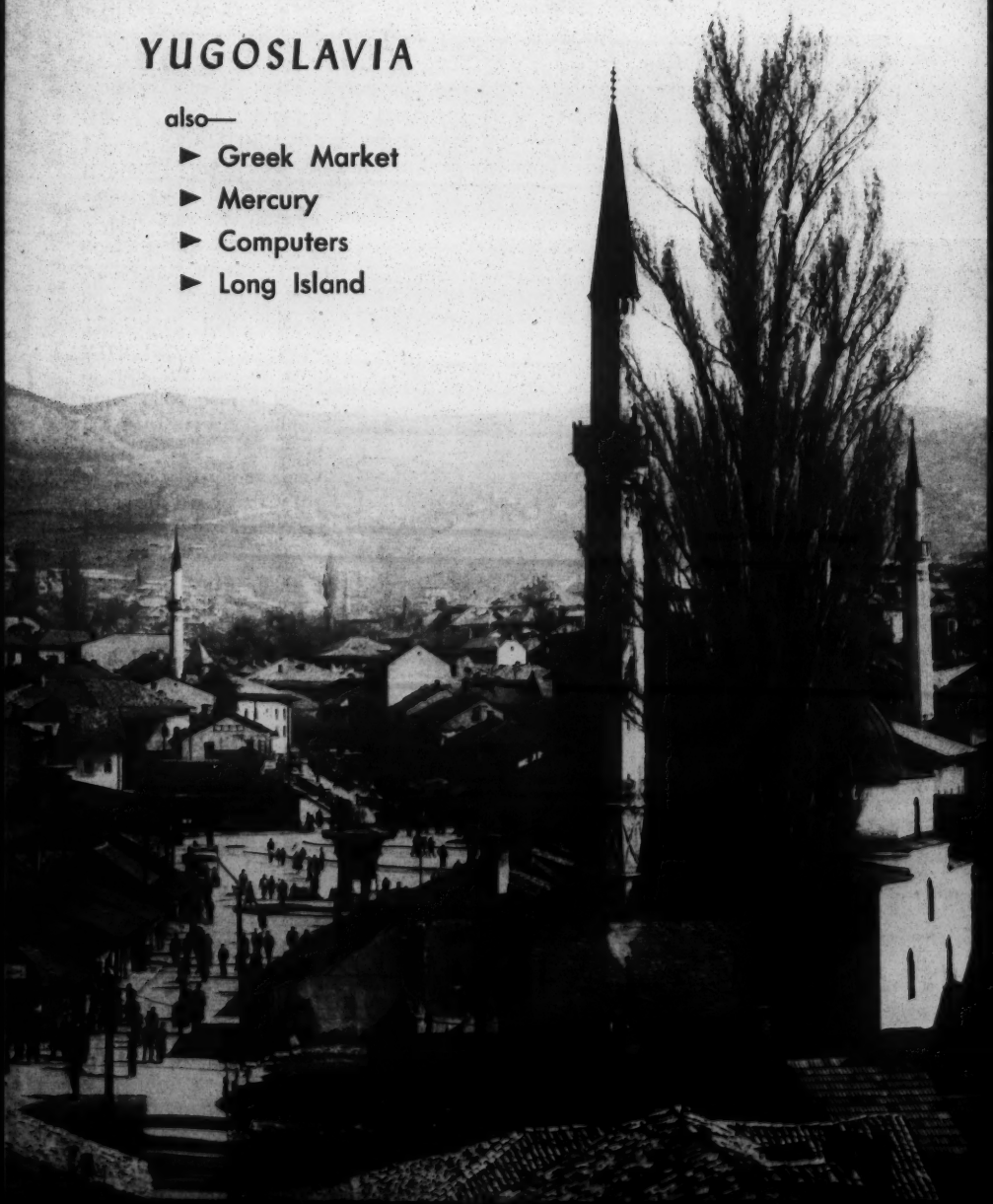
THE NATIONAL GEOGRAPHIC SOCIETY, WASHINGTON 6, D.C.

NOVEMBER 16, 1959, VOLUME 38, NUMBER 7 . . . *To Know This World, Its Life*

YUGOSLAVIA

also—

- ► Greek Market
- ► Mercury
- ► Computers
- ► Long Island



UMI

GSB MAP; BELOW, YUGOSLAV INFORMATION SERVICE

BIGGEST BALKAN nation, Yugoslavia has seven frontiers to guard, most of them shared by Soviet puppet states. It is a many-faceted land, with gray, barren mountains rising out of the Adriatic Sea, glacial peaks, rich farm regions, and gently rolling hills. Long undeveloped, it now struggles to take its place among industrialized nations. Below, a sign of the times: workers in a steel plant examine a blueprint.

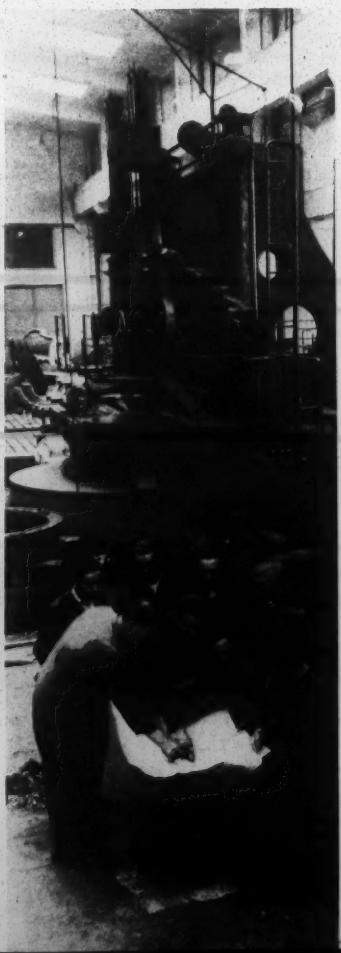
and Albania. Communist itself, Yugoslavia was also once a Russian satellite. But Yugoslavia was determined to have its own brand of Communism and in June, 1948, the Russians expelled it from the Cominform for its headstrong ways. Yugoslavia now receives economic aid from the West, calls itself neutral in the cold war.

Under Marshal Tito, who led the Partisans against the Nazis during World War II and became head of Communist Yugoslavia, the government owns all businesses, natural resources, and means of production. It controls every aspect of a citizen's life. This government is straining to put the nation on a sound industrial basis.

Although mountains and plateaus cover three-fourths of the country, the basic industry is agriculture. Almost three-quarters of Yugoslavia's 18,000,000 people live on the land, either on small peasant farms or on large state-owned cooperatives.

Fields of wheat, corn, and sugar beets make Voivodina, an autonomous province along the Hungarian and Romanian borders, Yugoslavia's chief source of food. Cattle, pig, and poultry farms also cover the area. It is such a rural region that Subotica, Yugoslavia's tenth largest city, is little more than a big village, with thatched houses and dirt roads not far from the municipal buildings. Once part of the Hapsburg Empire, Voivodina has many residents who speak both Serbian and Hungarian.

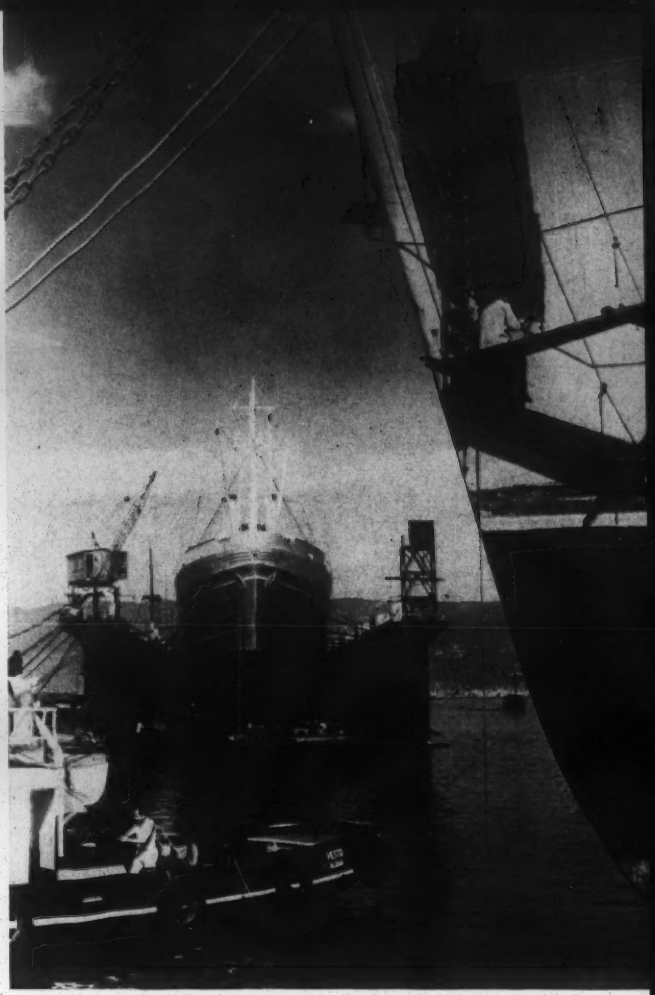
In the flat, fertile Voivodina region and the low lands of other areas where farming is the mainstay, the wooden plow was the rule, the tractor the ex-



UMI

Yugoslavia

Balkan Melting Pot Sets New Goals



GILBERT M. GROSVENOR, NATIONAL GEOGRAPHIC STAFF; COVER, YUGOSLAV INFORMATION SERVICE

YUGOSLAVIA is a nation struggling to catch up.

It rushes to build factories and hydroelectric plants, office buildings, shipyards (right), and apartment houses; to finish repairing the destruction left by World War II; and to leap from an underdeveloped and backward country to a modern nation.

These aims, no place easy, are particularly difficult in a nation as young and diverse as Yugoslavia. Its nearly 100,000 square miles once held a group of different peoples, each with its own culture. Their one link: almost all were southern Slavs. Yugoslavia means "Land of the South Slavs."

This area has been invaded from both east and west since before the time of Christ. Celts, Greeks, Romans, Turks, and Austrians spotted the landscape with reminders of their rule. Fourth century B.C. Greek settlers lived under laws recorded on a tablet found near Korčula and exhibited in its museum. In an arena at Pula, on the Adriatic Sea, Yugoslavs today stage operas and concerts where crowds of 23,000 once cheered Roman gladiators. Minarets, recalling the Ottoman Empire, finger the skyline of Sarajevo (see cover), where in June, 1914, a Serbian student assassinated an Austrian archduke and ignited World War I.

When Yugoslavia was created following that war, groups clung to their own traditions. Yugoslavia has two alphabets (Roman and Cyrillic), three religions (Greek Orthodox, Roman Catholic, and Moslem), four languages (Serbian, Croatian, Slovenian, and Macedonian), and five peoples (Serbs, Croats, Macedonians, Montenegrins, and Slovenians). Six republics (Serbia, Croatia, Slovenia, Bosnia-Hercegovina, Macedonia, and Montenegro) make up the Federated People's Republic of Yugoslavia.

Four of Yugoslavia's neighbors are Soviet satellites: Hungary, Romania, Bulgaria,

GEOGRAPHIC SCHOOL BULLETINS Copyright © 1959 by the National Geographic Society, Melville Bell Grosvenor, President. Published each week during school months by the School Service Division, Ralph Gray, Chief. Assistants: Arthur P. Miller, Jr., Frank Sartwell, Katherine Cropster, Liva Baker. Entered as second class matter, Washington, D.C. International copyright. All rights reserved. Rates: United States, $2.00 for 30 issues (one school year); Canada, $2.25; elsewhere, $2.50. U. S. only, 3 years (90 issues), $5.00. The National Geographic Society is a nonprofit educational and scientific society established for the increase and diffusion of geographic knowledge.

otherwise pretty industrial picture. While the government concentrates on building up the country and holds out luxuries as a promise for the future, young Yugoslavs look across at their Austrian and Italian neighbors and want what they see—nice apartments, motor scooters, and automobiles. Older people remember past hardships and are content to accept the improvements and the promises. The younger generation cannot compare the past and present.

Although Yugoslav universities date back as far as the 17th century, three-fourths of the population was illiterate before World War II. Today education is free and compulsory for eight years, and the number of Yugoslav students has multiplied seven times. Adult education programs help an older generation catch up.

There are pockets unreached by modernization. On market days farm women walk from village to town in full-skirted, embroidered costumes, cabbages balanced in baskets on their heads. Neighborhood groups pool their labor to thresh a wheat harvest by hand. Near a new aluminum plant in highly industrialized Slovenia, blacksmiths work in a hidden valley as they have for centuries, with water from mountain streams as power for their bellows. Many are so skillful, they can forge a horseshoe around a raw egg without breaking the shell. L.B.

DRIVE FOR LEARNING—Students cluster around microscope in science class. To battle the illiteracy that handicapped three-fourths of its population before World War II, Yugoslavia has built schools by the thousand across the country.

BELGRADE BUILDING PROGRAM erased scars of World War II, completely changed the face of Terazije Square, below, in the heart of the capital. Scaffolding marks more new buildings rapidly rising.

UMI

PHOTOGRAPHS FROM YUGOSLAV INFORMATION SERVICE

TIME OFF from the factory: Vacationers sport on Lake Bled near the Austrian border

ception, before 1941. The yield per acre was one of the lowest in Europe. Today factories produce farm machinery and fertilizers. Forestry, irrigation, and drainage projects increase. Experimental farms test new methods and crops. Plant nurseries and veterinary stations rise in agricultural regions. Production reaches new highs.

After World War II, more than half a million workers left the fields for the hundreds of factories that were built. Buses, trucks, automobiles, diesel motors, locomotives, and turbines, once wholly imported, now roll off Yugoslav assembly lines. Steel production multiplied more than 17 times between 1939 and 1956. New food factories, textile mills, chemical works, and rolling mills rise.

Before World War II, few manufactured goods left Yugoslavia. Today, railway cars, tank cars, agricultural machinery, motors, typewriters, electric motors, and radios are exported. Shipyards such as the one at Rijeka (page 74) build not only Yugoslav liners, but vessels for England and other countries.

Yugoslavia ranks second in Europe in waterpower resources. Thirty-seven hydro plants and 32 thermal plants—boosting output of electrical energy 432 per cent—were constructed within 10 years. Institutes for nuclear research are in operation in Belgrade, the capital, and Zagreb and Ljubljana.

New railroads and highways stripe more and more areas. Youth brigades in khaki blouses and slacks mixed and laid concrete to build 87 miles of "autoput," or motor road, last year—part of a new international highway which is to cross Yugoslavia from northwest to southeast by 1960.

Mining is increasing, with coal production skyrocketing from 7,000,000 tons in 1939 to 17,000,000 tons in 1956. Yugoslavia is a European leader in the production of bauxite, lead, antimony, chrome, copper, and zinc.

In spite of impressive statistics, dissatisfaction among young people stains the

HOTTEST AND COLDEST PLANET . . . MERCURY

IF THE TIME COMES when you can voyage in space, one of the last places you'll want to visit will be Mercury.

Closest to the sun of all the nine major planets, the tiny sphere (3,100 miles in diameter) is at the same time the hottest, coldest, speediest, and smallest—a batch of solar superlatives that spell discomfort.

As it makes its elliptical journey around the sun, at speeds up to 35 miles per second, Mercury spins slowly on its own axis so that the same side of the planet is constantly bathed in hot sunlight. (In the same way, the moon always presents its same face to the Earth —see GSB October 5, 1959.)

Bathed eternally in scorching rays, the bright side of Mercury is hot enough to melt lead or tin. It has been estimated at 700° Fahrenheit—the hottest place in the solar system, with the exception of the sun itself.

The unlit side, however, is the coldest spot. Other planets revolve fast enough so that sunlight warms all sides of them.

Mercury's atmosphere—only a thin wisp of heavy gas—is unable to distribute heat from the bright to the dark side, and the "back" of Mercury remains close to absolute zero—459.7° F. below zero.

There is one hope for a space explorer landing on Mercury. Because of a slight "wobble" in relation to the sun, the edges of the bright side are not always in exactly the same place. There is a band where light and shadow alternate, and temperatures are not quite so fiercely hot or cold.

Mercury's year—the time it takes to circle the sun—is only 88 Earth days long —the shortest year of any of the planets.

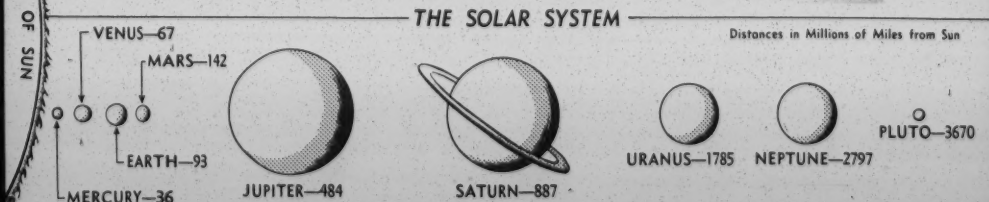
Astronomers find that Mercury reflects sunlight at about the same intensity as our moon does. Therefore, they believe that its surface is similar to the moon's —jagged mountains and plains pocked with craters. Like the moon, it is completely silent, for the thin atmosphere can carry no sound.

For earth-bound adventurers, Mercury is difficult to spot. It never rises much above the horizon, and a good viewing place is necessary—the lights and hazy atmosphere of a city can hide it. It appears only in the evening or the morning. At other times it is lost in the sun's glare or below the horizon. Scientists studying the planet's surface reverse the astronomer's usual working day. They peer at Mercury when it is high in the sky in daylight. Such studies have produced drawings of mysterious markings —gray against a pinkish background— on the face of the planet.

Some astronomers believe they have seen clouds on the face of Mercury. If so, they are doubtless dust, and not water droplets like Earth's clouds. Water would vaporize instantly in the low pressures and high heat of Mercury.

A century ago, astronomers found that Mercury was coming closer to the sun than mathematics said it should. The pull of an unseen planet closer to the sun was believed responsible. But the inside planet, named Vulcan, was never found. Einstein's theory of relativity solved the problem, and Vulcan was erased from the list of planets. F.S.

This drawing shows the planets at their relative distances from the sun. Their sizes are greatly exaggerated so that relationships between them can be clearly seen. If drawn to true scale, even Jupiter and Saturn would be tiny dots.



UMI

PAINTING BY H. M. HERGET

Ancient Greeks Sold Goods, Gave Away Ideas

EXCITED CITIZENS of Athens gather in the Agora—the civic center and market place below the Acropolis—to discuss an important matter. One of their fellow citizens, Aristides, hero of the Persian wars, is becoming too powerful—perhaps dangerous to the State. Enemies hastily scratch his name on *ostrakons*—broken bits of pottery—and proceed to the Assembly to vote. The majority vote against him and the hero is banished, *ostracized,* from his city for ten years.

This is typical of life in Athens 2,500 years ago, when each individual played a vital role in all civic affairs.

The agoras of Greek city-states served the same purpose as the Roman Forum, or New England's village greens, but more intensely, for all forms of public activity were focused there. From the Agora of Athens sprang the roots of Western democracy, philosophical thought, and art.

Socrates, standing barefoot in the open market, discussed philosophy with all comers. Herodotus read his chronicles to eager throngs. In the majestic court building beside the square, Solon and Demosthenes established early principles of individual freedom. Aristotle presented essays on constitutional law.

Almost every day, Athenians gathered for lively discussions along colonnades of the *stoas,* which housed shops and offices of the market place. The grandest of these, the Stoa of Attalos, spread a stately marble colonnade 386 feet long.

The Agora was the focal point of the Greek world for nearly 900 years. Laid out in 600 B.C., it was finally destroyed in A.D. 267 by barbarians from the north.

For centuries layer upon layer of civilization built on the ruins. Then, in 1931, The American School of Classical Studies at Athens began the tremendous task of digging out the Agora. After 28 years, the work is nearly complete.

The Stoa of Attalos has been restored to its original design, its blue and white marble façade gleaming beneath the Acropolis as it did 2,100 years ago. It houses a superb museum, filled with precious relics found on the spot. K.C.

For a fuller description of the Greek world, see EVERYDAY LIFE IN ANCIENT TIMES, published by the National Geographic Society. $6.00.

tern of magnetic dots that represent the figure 2. An electromagnet within the machine reads the pattern, as sensitive fingers read Braille. The magnet relays the symbol for 2 in the form of electric impulses into the machine. A second group of dots, of the same pattern, is on the tape and the second 2 symbol joins the first.

Meanwhile the control tape has been fed in, instructing the machine to add the two symbols. The combination of these three symbols—two 2's and a plus sign—triggers a preset circuit that pulses out a symbol for 4, much as the setting of an alarm clock makes it pulse with sound when the proper time is reached.

If other symbols are fed in, of course, other results are obtained. The control tape may order subtraction, multiplication, or division; or it may tell the computer to store the first answer and combine it with others before presenting a final answer.

This illustration is extremely simplified. A computer, instead of handling 2's and 4's, will work with 10-digit numbers such as 8,563,259,330. Because its electric impulses move so fast, it can deal with complicated problems in just a twinkling.

What's more, it is never wrong. Each computer checks its answers many times as it goes along. An incorrect result may, however, turn up if incorrect information was fed in at the beginning. No computer can correct its master's mistakes.

Future businessmen, scientists, and engineers will save mental drudgery by using computers. Already the swift machines are affecting your life. Computers keep track of bank accounts, tabulate taxes, send out utility bills, add up Social Security payments, keep your name on magazine lists, and reserve airline seats.

One clever machine at Pasadena, California, translates four languages into idiomatic English.

Introduced to business a scant five years ago, computers have already wrought a revolution. Today life insurance companies, beset by snowstorms of statistics, are enthusiastic customers. So are banks, hospitals, factories. Computers help weathermen predict the elements. With electronic machines in universities and laboratories, men probe deeper than ever before into secrets of earth and universe. A.P.M.

NATIONAL GEOGRAPHIC PHOTOGRAPHER THOMAS NEBBIA

UMI

Computers, Wizards at Math

WHILE winter whistles outside their schoolhouse in Finland, three Lapp youngsters click the counters of their abacus, learning their sums.

Meanwhile, in a shiny Florida office, lights flash and signals hum as a blonde physicist flicks a switch on the multi-paneled console of an electronic computer below. Mrs. Helen Mann works at the Cape Canaveral missile test center, compiling a mathematical picture of how missiles perform in flight.

Mrs. Mann and the boys seem a Space Age apart. Actually both are using calculating machines based on the same principle. Mrs. Mann's digital computer, of course, can do more than its forerunner, the abacus. Electronic eyes blinking, wires crackling, it can not only add and subtract, it can multiply and divide, list, classify, select, file, compare, even "remember."

WERNER BISCHOF, MAGNUM

But as one expert observed: "A computer can do nothing that a boy who is good at arithmetic cannot do, except it can do it faster, more accurately, and without getting tired."

Electronic computers are the latest advance in man's search for an easier way to do his mathematics homework. Caveman counted on his fingers. When he ran out of fingers, he laid pebbles in a row. One day a clever fellow, possibly Chinese, suggested stringing pebbles or beads in a frame. Result: the abacus, the world's first calculating machine. It still is widely used, especially in the Far East.

But the abacus could hardly hope to cut through the thickets of statistics that have sprung up around modern science and technology. The adding machine, invented before the 20th century, helped. But it took the electronic experience of World War II to make possible the creation of the tool to clear out the mathematical underbrush.

It is called "electronic data processing." Its heart is the computer.

The *analogue computer*, true to its name, works by analogy. Basically, it is a measuring device. The speedometer in your family auto works this way. It converts the rate of turning of the driveshaft into miles per hour on the dashboard dial.

The brainiest type is the *digital computer*. An abacus gone electronic, it takes raw digits, processes them, arrives at an answer. A computer like Mrs. Mann's can solve any problem that can be expressed numerically.

Taking the simplest example, suppose you wanted your computer to add two and two. On one type of machine the problem would be handled like this:

Two tapes are fed in. One bears a pat-

GSB MAP

LONG LONG ISLAND points a 120-mile finger into the Atlantic Ocean. It is made up of rocks and soil deposited by an Ice Age glacier, and marked by flat fields, rolling hills, and a 600-mile shore line crowded with bathing beaches, harbors, and fishing grounds.

homes were strung along the dunes of fashionable Southampton on the south shore.

Some estates, relics of "the good old days," are still homes. But high taxes have taken a large toll. School bells replace butlers' bells in many of the mansions. The Walter P. Chrysler estate at Kings Point is now the United States Merchant Marine Academy. The home of Mrs. Robert Dodge, Mill Neck, now houses the Lutheran School for the Deaf. The 57-room mansion of J. P. Morgan in Glen Cove is now a novitiate of the Sisters of St. John the Baptist. C. W. Post College in Brookville was once the home of Mrs. Marjorie Merriweather Post May.

Today the high social life has faded, just as the potato farms (below) have been pushed back. The outstanding feature of the island is its split-level suburbia. Both Nassau and Suffolk Counties have almost tripled their population since before World War II, nearly doubled it between 1950 and 1957. There is no end in sight to the exodus from stone-faced New York City to grassy suburbia.

Rows and rows of look-alike houses line streets, some still unpaved, even unnamed, in developments hard put to keep pace with the demand. Schools, filled beyond capacity, run on double sessions until new buildings can be built. Huge shopping centers cluster around branches of New York department stores. Men commute to their old jobs in the city on the Long Island Railroad, which runs the length of the Island.

Many newcomers, after a harried try at commuting, give it up for jobs on the Island, reading their morning paper at the breakfast table instead of on the train, and spending extra hours with their families in the evening.

New York manufacturers, especially those in the fields of apparel, electronics, chemicals, plastics, and other divisions of light manufacturing, have moved to Long Island. Large aircraft plants cover tracts of Nassau and Suffolk Counties.

A few miles east of the newly painted developments and factories lie acres of rich farmland accented by single

NATIONAL GEOGRAPHIC PHOTOGRAPHER ROBERT F. SISSON

UMI

LONG ISLAND

Spreading Suburbs Elbow Fisherman and Farmer

MRS. SUBURBIA, her hair in curlers, drives her husband from one of the innumerable homes of Levittown (seen from air, right) to join the army of commuters at the railroad station. . . .

A debutante bows to society under a gaily-decorated marquee on a north shore "Gold Coast" estate. . . .

Potato diggers claw fat, flat fields. . . .

Another farmer, the oysterman, hauls in his harvest for gourmets around the world. . . .

A physicist patiently checks his labyrinth of equipment as he hunts peaceful uses for atomic energy. . . .

Indians beat tom-toms at an annual powwow . . . Sunday sailors crowd blue water . . . Week-end sun bathers cover nearly every grain of sand on famous Jones Beach. . . .

These are the life of Long Island, New York. There is room for all of them and more on this truly long island which juts 120 miles into the Atlantic Ocean. Including Kings and Queens Counties (geographically a part of the island, but politically a part of New York City), Long Island covers 1,723 square miles (see map).

FAIRCHILD AERIAL SURVEYS

Settled at the beginning of American history—Southold and Southampton, founded in 1640, are among the oldest patented townships in New York State—Long Island is studded with historical mementos, famous names, and legends of the past.

George Washington toured the area in 1790, and today historical markers point out where he stopped for a meal, where he slept, and where his horse was stabled. During the Revolution, Long Island was occupied by the British. North shore residents still recount the tale of Nancy's clothesline. Nancy Strong hung her black petticoat on the line as a signal to American spies that British boats lurked in near-by coves.

Many early Long Islanders achieved more than local fame. Walt Whitman was born in Huntington and edited a weekly newspaper which is still published there. Theodore Roosevelt was a Long Islander. His home in Oyster Bay is now a museum. William Cullen Bryant lived in Roslyn Harbor.

More recently, Long Island became a playground of the rich. A 15-minute drive from the New York City line, millionaires played polo regularly. Magnificent yachts tied up on the north shore. Names like Gould, Whitney, and Vanderbilt marked driveways leading through the hills to baronial mansions on the Gold Coast. Palatial

old-fashioned farmhouses. The Long Island farmer grows potatoes, cauliflower, strawberries, and lima beans—and the famous "Long Island duckling" (below)—to mention just a few of the sixty-odd local crops.

Fishing is a $9,000,000 a year business. Little Neck clams and Blue Point oysters are known the world over. Bay and sea scallops are other leading water crops.

With all the bustling activity on the island, it has never lost its status as a popular vacationland. Its beaches attract sun bathers and swimmers at the first hint of summer. Every year people pour in like the tide for the three summer months.

Famous names from the Broadway stage, the worlds of art, literature and music, radio, television, industry, and the Social Register share the sun with ninth generation Long Islanders. L.B.

● See "Long Island Outgrows the Country" by Howell Walker in the March, 1951, *National Geographic* ($1.00); "Kings Point: Maker of Mariners" by Nathaniel T. Kenney in the November, 1955, *National Geographic* ($1.00); "*Nomad* Sails Long Island Sound" by Thomas Horgan in the September, 1957, *National Geographic* ($1.00); National Geographic Atlas Map, Northeastern United States (50 cents).

NATIONAL GEOGRAPHIC PHOTOGRAPHER VOLKMAR WENTZEL

MAN FROM MARS, or what the well-dressed radiation decontaminator wears at Brookhaven National Laboratory, operated by nine universities and the Atomic Energy Commission. Its scientists produce no bombs; they study the atom to improve, not destroy, life. The lab lies inland from the town of Brookhaven.

LONG ISLAND DUCKLINGS, bound for restaurants around the world, detour for a swim during their short but pampered lives on Suffolk farms. Fattened on vitamin-rich feed for nine weeks, they will perpetuate the Island's name as the world's foremost duck-raising section.

NATIONAL GEOGRAPHIC PHOTOGRAPHER B. ANTHONY STEWART

UMI